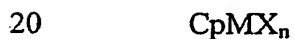


Claims

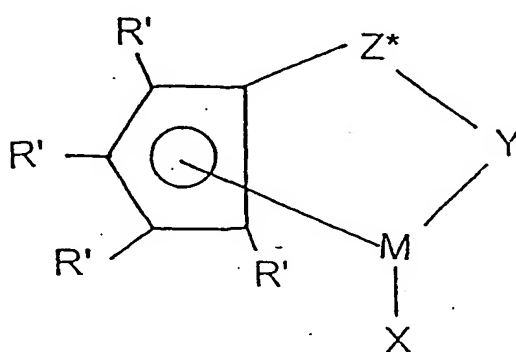
1. A supported catalyst composition system comprising
 - (a) a dehydrated support material,
 - (b) a transition metal compound, and
 - (c) an activator
- 5 *characterised in that* said support material has been pretreated with at least two different organoaluminum compounds prior to contact with either or both the transition metal compound or the activator.
2. A supported catalyst system according to claim 1 wherein the support is an particulated solid material.
- 10 3. A supported catalyst system according to claim 2 wherein the support is silica.
4. A supported catalyst system according to any of the preceeding claims wherein the organoaluminium compounds are trialkylaluminium compounds.
5. A supported catalyst system according to any of the preceeding claims wherein the organoaluminium compounds are contacted sequentially with the support material.
- 15 6. A supported catalyst system according to any of the preceeding claims wherein the transition metal compound is a metallocene.
7. A supported catalyst system according to claim 6 wherein the metallocene has the formula:



wherein Cp is a single cyclopentadienyl or substituted cyclopentadienyl group optionally covalently bonded to M through a substituent, M is a Group VIA metal

bound in a η^5 bonding mode to the cyclopentadienyl or substituted cyclopentadienyl group, X each occurrence is hydride or a moiety selected from the group consisting of halo, alkyl, aryl, aryloxy, alkoxy, alkoxyalkyl, amidoalkyl, siloxyalkyl etc. having up to 20 non-hydrogen atoms and neutral Lewis base ligands having up to 20 non-hydrogen atoms or optionally one X together with Cp forms a metallocycle with M and n is dependent upon the valency of the metal.

8. A supported catalyst system according to claim 6 wherein the metallocene is represented by the general formula:



wherein:-

R' each occurrence is independently selected from hydrogen, hydrocarbyl, silyl, germyl, halo, cyano, and combinations thereof, said R' having up to 20 nonhydrogen atoms, and optionally, two R' groups (where R' is not hydrogen, halo or cyano) together form a divalent derivative thereof connected to adjacent positions of the cyclopentadienyl ring to form a fused ring structure;

X is a neutral η^4 bonded diene group having up to 30 non-hydrogen atoms, which forms a π -complex with M;

Y is -O-, -S-, -NR*-, -PR*-;

M is titanium or zirconium in the + 2 formal oxidation state;

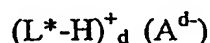
Z* is SiR*₂, CR*₂, SiR*₂SIR*₂, CR*₂CR*₂, CR*=CR*, CR*₂SIR*₂, or GeR*₂, wherein:

R* each occurrence is independently hydrogen, or a member selected from hydrocarbyl, silyl, halogenated alkyl, halogenated aryl, and combinations thereof, said

R* having up to 10 non-hydrogen atoms, and optionally, two R* groups from Z* (when R* is not hydrogen), or an R* group from Z* and an R* group from Y form a ring system.

9. A supported catalyst system according to any of the preceeding claims wherein the activator is an aluminoxane or a borane.

10. A supported catalyst system according to claims 1 to 8 wherein the activator has the formula:



wherein

L* is a neutral Lewis base

(L*-H)⁺_d is a Bronsted acid

A^{d-} is a non-coordinating compatible anion having a charge of d⁻, and

d is an integer from 1 to 3.

11. A supported catalyst system according to claim 10 wherein the anion comprises a boron metal.

12. A supported catalyst system according to claim 10 wherein the activator comprises a cation and an anion and wherein the anion has at least one substituent comprising a moiety having an active hydrogen.

13. A supported catalyst system comprising

(a) a dehydrated support material,

(b) a transition metal compound, and

(c) an activator comprising (i) an organoaluminium compound and (ii) an

organoboron compound,

characterised in that said support material has been pretreated with at least two different organoaluminum compounds prior to contact with either or both the transition metal compound or the activator.

14. A supported catalyst system according to claim 13 wherein the activator comprises a trialkylaluminium compound and a triarylboron compound.

15. A process for the polymerisation of olefin monomers selected from (a) ethylene, (b) propylene (c) mixtures of ethylene and propylene and (d) mixtures of (a), (b) or (c) with one or more other alpha-olefins, said process performed under polymerisation

conditions in the presence of a supported catalyst system as claimed in any of the preceeding claims.

16. A process for the polymerisation of ethylene or the copolymerisation of ethylene and α -olefins having from 3 to 10 carbon atoms, said process performed under
5 polymerisation conditions in the presence of a supported polymerisation catalyst system as claimed in any of claims 1-14.

17. A process according to claims 15 or 16 wherein the α -olefin is 1-butene, 1-hexene, 4-methyl-1-pentene or 1-octene.

18. A process according to any of claims 15 to 17 performed in the solution, slurry
10 or gas phase.

19. A process according to any of claims 15 to 18 performed in a fluidised bed gas phase reactor.

20. A process for the preparation of copolymers of ethylene and alpha-olefins having

- 15 (a) melt strength (16 Mpa) in the range 3 – 12 cN, and
(b) a molecular weight distribution (Mw/Mn) of > 2 .

said process comprising contacting ethylene and one or more alpha-olefins in the presence of a supported metallocene catalyst system as claimed in any of claims 1 to 14.

21. A dehydrated catalyst support material *characterised in that* said support
20 material has been pretreated with at least two different organoaluminum compounds prior to the addition of further catalyst components.